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POLYCHAETE WORMS FROM A CAVE IN THE BAHAMAS AND FROM EXPERIMENTAL WOOD PANELS IN DEEP WATER OF THE NORTH ATLANTIC (POLYNOIDAE: MACELLICEPHALINAE, HARMOTHOINAE)

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Abstract.—*Pelagomacellicephala iliffei,* n. gen., n. sp. a macellicephalin polynoid is described from a cave in Middle Caicos Island, *Bathykermadeca turnerae,* n. sp. and *Bathybahamas charleneae,* n. gen., n. sp. also in the Macellicephalinae, and *Harmothoe ingolfiana* and *H. vagabunda,* n. sp. in the Harmothoinae are described from four experimental "wood islands" in deep water of the North Atlantic.

Of particular interest is a recent collection of some polynoid polychaetes from Conch Bar Cave, Turks and Caicos islands in the Bahamas, belonging to the Macellicephalinae, a subfamily of the Polynoidae known primarily from the deep sea, including bathyal and abyssal depths (Pettibone 1976). Four specimens were collected by Thomas M. Iliffe and Jill Yager in connection with their studies of cave faunas. They are referred, herein, to *Pelagomacellicephala iliffei,* n. gen., n. sp. The following comments on the habitat of the worms were kindly furnished by Dr. Iliffe.

The Turks and Caicos Islands are geologically and geographically a southeastward extension of the Bahamas. The Bahama Platform, including the Caicos Bank, consists of a cap of shallow water carbonates thicker than the surrounding ocean is deep (Dietz *et al.* 1970). This suggests that a shallow water depositional environment has been maintained in this region since at least the early Cretaceous. Slow subsidence, offset by deposition of coral and algal carbonates, has maintained the top of the platform nearly at sea level.

The Caicos Bank is a shallow water platform bordered by a series of islands extending along the northern and eastern margins. The major islands consist of a broad expanse of low lying flat land facing the interior of the platform, while a range or series of ranges of eolian carbonate hills 20 to 40 m in elevation fronts the seaward margin, parallel to the long axis of the islands. The youngest hills closest to the seashore are unconsolidated dunes consisting of reef-derived carbonate sand washed ashore and then blown inland by the prevailing trade winds. Those hills further inland are older, probably Pleistocene in age, and have been lithified into a hard eolian limestone. Caves are situated within these lithified dunes, while large circular collapsed shafts, called "blue holes" (Dill 1977), are found in shallow waters of the interior platforms.

Conch Bar Cave, reportedly in excess of 2.5 km long (Gregor 1981), is the largest and most significant cave in the Turks and Caicos group. The cave is developed in a coastal dune-derived hill (Conch Bar Hill) located 500 m inland from the open ocean. It consists of multiple levels, the lowest of which is permanently flooded with tidal brackish waters 10 or more meters deep. The four

polynoids were collected from a broad shallow pool containing considerable amounts of organic detritus including leaves, twigs, and land snail shells in the sediments. Surface salinity in the pool was 23‰. Other animals found in the cave include the amphipod *Spelaeonicippe provo,* large numbers of the shrimps *Barbouria cubensis* and *Typhlatya garciae,* a new species of troglobitic mysid *Stygiomysis clarkei* described by Bowman *et al.* (1984) and several copepods now under study.

Another troglobitic polynoid was found inhabiting a sea water-flooded lava tube cave in the Canary Islands, the Jameos del Agua, collected by Wilkens and Parzefall (1974). It was described as *Macellicephala jameensis* in the Macellicephalinae by Hartmann-Schroder (1974), later revised and referred to a new genus, *Gesiella,* in the Harmothoinae by Pettibone (1976:64), and, still later, referred to a new subfamily, Gesiellinae, by Muir (1982:173). This extensive lava cave, despite being only 3000 to 5000 years old, contains fauna of both Tethyan and deep sea origins (Wilkens and Parzefall 1974; Iliffe *et al.* (1984).

A number of studies have pointed out the importance of plant remains of shallow-water or epipelagic origin (wood, leaves, fruit, sea grass, *Sargassum,* etc.) to the macrofauna of the deep sea, and these are summarized by Torben Wolff (1979). For instance, wood is used as a substrate and food for opportunistic boring bivalve mollusks, such as *Xylophaga.* Such macrofaunal herbivores are available as prey for predators, as dead remains for scavengers, and their fecal pellets can be utilized by deposit feeders. Polychaetes were found to be the dominant group, seeking shelter under the bark and in cavities of the wood.

Four species of deep-sea polynoids have been identified from wood panels that were submerged and later retrieved after one to three years at four permanent DSRV *Alvin* deep Atlantic bottom stations, in connection with the experimental studies being carried out by Ruth Turner on wood-boring mollusks (Pholadidae, Xylophagainae: *Xylophaga* and *Xylorado*). Turner (1973) found that after three and a half months some wood panels that had been pushed into the bottom sediment at a depth of 1830 meters were riddled by the burrows of the bivalve mollusks. These deep-sea wood-borers are opportunistic species and ". . . are the most important deep-sea organisms involved in converting woody plant material to available food sources (1) in the form of fecal pellets for detritus feeders, (2) as larvae or adults, exposed by distintegration of the wood, for predators, and (3) as dead remains for scavengers" (Turner 1973:1379).

In connection with the "wood-island" and panel experiments of Turner (1977, 1981), large "wood islands" (12 blocks of spruce, 30 cm on a side) were placed by DSRV *Alvin* at two Deep Ocean Stations (DOS) south and southeast of Woods Hole, Massachusetts, in 1830 and 3506 meters, one in the Tongue of the Ocean (TOTO, TOWER 3), the deep "fjord" in the shallow Great Bahama Bank, in 2066 meters, and one off St. Croix in 3995 meters. Around these "wood islands," a series of wood panels (60 by 15 by 3 cm) were pushed in the mud. When the areas were visited later, some panels were retrieved and replaced after variable lengths of time, from 9 months to three years. The panels were placed in retrieval boxes for fixation of the specimens at bottom temperature and pressure, assuring the best possible condition of the specimens. From the panels riddled by the boring xylophagids, a great variety of other organisms was collected, including detritus feeders and predators, and, among the latter, numerous polynoid worms.

Table 1.—Polychaetes identified from wood panels in North Atlantic.

Species	DSRV *Alvin* "Wood Island" Stations			
	DOS-1	DOS-2	TOTO Tower 3	St.-Croix
Polynoidae:				
Macellicephalinae:				
Bathykermadeca turnerae, n. sp.	2 spec.	10 spec. (some young)	33 spec. (many young)	51 spec. (many young)
Bathybahamas charleneae, n. gen., n. sp.			2 spec.	
Harmothoinae:				
Harmothoe ingolfiana Ditlevsen	372 spec. (many young)	184 spec. (many young)		
Harmothoe vagabunda, n. sp.			7 spec.	36 spec. (many young)
Ampharetidae:*				
Decemunciger apalea Zottoli	69 spec. (64 juv.)	26 spec. (10 juv.)	1 spec. (juv.)	
Endecamera palea Zottoli				18 spec.

* See Zottoli (1982).

After preliminary sorting by Helene Ferranti and Charlene D. Long, assistants to Ruth Turner, the polynoid worms were sent to me for identification. From this collection of Polynoidae, four species were identified, two belonging to the usually deep water Macellicephalinae and two in the Harmothoinae. Zottoli (1982) reported on the polychaetes of the sedentary tube-dwelling family Ampharetidae, which were collected on some of the same panels.

The collection sites and species of Polynoidae and Ampharetidae are summarized below and in Table 1.

Locations of four experimental "wood islands":

1. Deep Ocean Station-1 (DOS-1), 110 miles south of Woods Hole, Massachusetts, 39°46′N, 70°41′W, in 1830 meters.

2. Deep Ocean Station-2 (DOS-2), 190 miles southeast of Woods Hole, Massachusetts, 38°18′24″N, 69°35′36″W, in 3506 meters.

3. Tongue of the Ocean, Bahama Islands (TOTO, TOWER 3), 24°53′12″N, 77°40′12″W, in 2066 meters.

4. Off St. Croix, Virgin Islands, 17°57′36″N, 64°48′36″W, in 3995 meters.

The types and additional specimens are deposited in the National Museum of Natural History, Smithsonian Institution (USNM). Types of *Harmothoe ingolfiana,* deposited in the Zoological Museum, Copenhagen (ZMC), were examined.

Family Polynoidae

Subfamily Macellicephalinae Hartmann-Schroder, 1971

Pettibone (1976:6–42) included seven genera in the subfamily Macellicephalinae, the type-genus *Macellicephala* McIntosh, 1876, and six new genera: *Bathycatalina, Bathyeliasona, Bathyfauvelia, Bathykermadeca, Bathykurila,* and *Bathyvitiazia.* Pettibone (1979:384–388) emended *Bruunilla* Hartman, 1971, and added

it to the subfamily. Levenstein (1981:27–29) added *Bathypolaria* and *Bathymiranda.* Levenstein (1982b:1291–1296) added *Bathytasmania* and *Bathynotalia* and provided a key to the genera of the Macellicephalinae. However, her figure of the type-species of *Bathynotalia, B. perplexa,* shows the prostomium with lateral antennae (not mentioned in the text), in addition to the median antenna, palps and tentacular cirri (fig. e, in Levenstein 1982b). On this basis the genus is herein referred to Harmothoinae. Further, the prostomium of *Bathymiranda microcephala* Levenstein (1981, fig. 2a) lacks both lateral and median antennae and, on this account, is referred herein to Polaruschakovinae Pettibone, 1976.

Diagnosis of Macellicephalinae.—Body short, with relatively few segments (15–24). Prostomium bilobed; median antenna with distinct ceratophore and distal style; paired palps; without lateral antennae, with or without tapered frontal filaments; without eyes. Modified first or tentacular segment more or less fused to prostomium; tentaculophores lateral to prostomium, each with acicular process of variable development, with or without few setae and pair of dorsal and ventral tentacular cirri. Facial tubercle anterior and ventral to prostomium, more or less developed. Second or buccal segment with first pair of elytra, biramous parapodia and long ventral or buccal cirri attached basally on neuropodia lateral to ventral mouth. Muscular pharynx eversible, with 2 pairs of jaws and up to 9 pairs of papillae around opening. Parapodia long, biramous, both notopodia and neuropodia subconical with elongate acicular processes. Paired elytra and bulbous elytrophores relative few (7–12 pairs), on segments 2, 4, 5, 7, continuing on alternate segments to near end of body. Dorsal cirri with cylindrical cirrophores and distal styles, attached posterior to notopodia on segments 3, 6, 8, continuing on alternate and posterior segments lacking elytra. Dorsal tubercles on cirrigerous segments, corresponding in position to elytrophores, indistinct or more or less developed. Ventral cirri short, on ventral side of neuropodia on all segments. Pygidium variable in position and size, with dorsal anus and pair of anal cirri. Ventral nephridial or segmental papillae indistinct or variously developed on certain segments.

Three genera, each with a single species, are covered in this report: *Pelagomacellicephala iliffei,* new genus, new species; *Bathykermadeca turnerae,* new species; *Bathybahamas charleneae,* new genus, new species.

Pelagomacellicephala, new genus

Type-species.—*Pelagomacellicephala iliffei,* new species. Gender: feminine.

Diagnosis.—Segments up to 21. Elytra and elytrophores 9 pairs, on segments 2, 4, 5, 7, 9, 11, 13, 15, and 17. Bilobed prostomium with rounded anterior lobes, without frontal filaments, with median antenna and palps, without lateral antennae or eyes. Tentaculophores of tentacular segment with 2 pairs of tentacular cirri, without projecting acicular process or setae. Dorsal cirri on non-elytra-bearing segments, with long styles. Dorsal tubercles on cirrigerous segments short, nodular. Parapodia long, biramous, both rami with projecting acicular processes, notopodia much shorter and smaller than neuropodia. Notosetae few, shorter and subequal in width to neurosetae, with double rows of close-set thickened serrations along one side. Neurosetae numerous, delicate, flattened, with serrate lateral borders. Ventral cirri short, but long on segment 2. Pharynx with pair of extra long mid-

dorsal and midventral papillae and 4 pairs of short lateral papillae; 2 pairs of jaws with basal teeth.

Etymology.—*Pelago,* from *pelagos,* Greek, sea, plus *macellicephala,* indicating the close relationship of this sea worm to the type-genus of the subfamily. Gender: feminine.

Pelagomacellicephala iliffei, new species
Fig. 1

Material examined.—BAHAMAS: Turks and Caicos Islands, Middle Caicos Island, Conch Bar Cave, 28 Oct 1982, collected by hand with suction bottle while snorkeling in large 1 to 1.5 m deep tidal pool in totally dark section of cave, Thomas M. Iliffe and Jill Yager, collectors; holotype, USNM 96262, and 3 paratypes, USNM 96263-5.

Description.—Length of holotype (largest specimen) 9 mm, width 5 mm including setae, segments 21, last one small. Length of smallest young paratype (USNM 96264) 5 mm, width 2.5 mm, segments 19. Body flattened, tapered anteriorly and posteriorly, with long parapodia angled downward. Color: white, translucent, giving general appearance of pelagic polychaete.

Elytra and bulbous elytrophores 9 pairs, on segments 2, 4, 5, 7, 9, 11, 13, 15, and 17 (Fig. 1A, C). Elytra large, covering dorsum, delicate, transparent, showing "veins," without tubercles or papillae (Fig. 1G). Dorsal cirri on non-elytra-bearing segments; dorsal tubercles on cirrigerous segments from segment 8, short, nodular (Fig. 1B, D).

Prostomium deeply bilobed, with anterior lobes rounded; median antenna with small ceratophore in middle of prostomium, with very long, slender, smooth style; palps stout, long, tapered (Fig. 1A). Tentacular segment not distinct dorsally; tentaculophores lateral to prostomium, with 2 pairs of long dorsal and ventral tentacular cirri, those dorsal longer than ventral ones; bilobed facial tubercle anterior to prostomium (Fig. 1A). Second or buccal segment with first pair of large elytrophores, well-developed biramous parapodia and ventral or buccal cirri similar to tentacular cirri, attached to basal part of neuropodia lateral to ventral mouth (Fig. 1A). Pharynx with especially long middorsal and midventral papillae and 4 pairs of small papillae near lateral borders (Fig. 1H); 2 pairs of jaws with basal teeth (11–15) (Fig. 1I).

Parapodia biramous, as long as body width (Fig. 1A–D). Notopodia much shorter than neuropodia, subconical, with projecting acicular process on lower side. Notosetae few (up to 6), delicate, slightly curved, with 2 rows of close-set thickened serrations along one side and blunt tips (Fig. 1E). Neuropodia large, with projecting triangular acicular process, diagonally truncate supraacicular area and slightly rounded, truncate, subacicular area. Neurosetae numerous, forming fan-shaped bundle, delicate, fragile (many broken), flattened, serrate along lateral borders (Fig. 1F). Dorsal cirri with cylindrical cirrophores attached to posterodorsal side of notopodia; styles delicate, transparent, smooth, variable in length, some extending to tips of setae or far beyond (on small paratype, some dorsal cirri up to half length of animal) (Fig. 1D). Ventral cirri short, tapered, attached close to distal end of neuropodia (Fig. 1C, D).

Pygidium bulbous, enclosed by parapodia of posterior segments, with dorsal

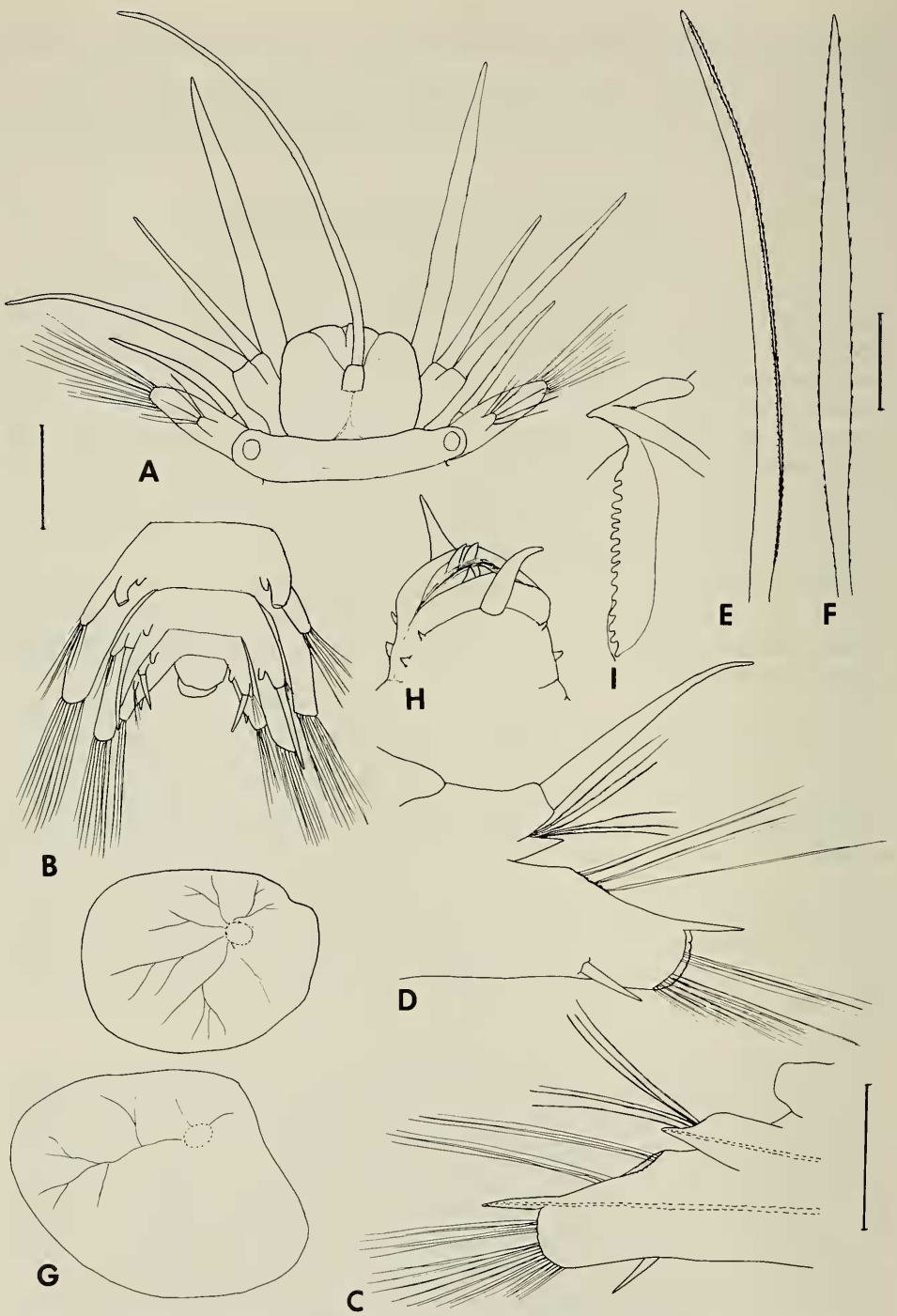

Fig. 1. *Pelagomacellicephala iliffei,* A–G, holotype, USNM 96262; H, I, paratype, USNM 96265: A, Anterior end, dorsal view; B, Posterior end, dorsal view, including cirrigerous segments 19–21; styles of dorsal cirri missing on segment 19; C, Right elytrigerous parapodium segment 9, anterior view, acicula dotted; D, Right cirrigerous parapodium segment 10, posterior view; E, Notoseta; F, Neuroseta; G, Two left elytra; H, Dorsal view of extended pharynx, turned slightly to right; I, Jaw. Scales: = 0.5 mm for A, B, G, H; 0.5 mm for C, D; 0.1 mm for E, F, I.

anus and rounded ventral lobe, anal cirri missing (Fig. 1B). Ventral segmental or nephridial papillae indistinct, none enlarged.

Distribution.—Known only from anchialine habitat of Conch Bar Cave, Middle Caicos, Turks and Caicos Islands, Bahamas. (See Introduction.)

Etymology.—The species is named for Thomas M. Iliffe, one of the collectors, in recognition of his interesting studies on cave faunas.

Comparisons.—The pharynx of *Pelagomacellicephala* differs from all other genera in the Macellicephalinae in having especially long middorsal and midventral papillae, small lateral papillae and jaws with a row of basal teeth. *Pelagomacellicephala iliffei* may be separated from the other two species of Macellicephalinae described herein according to the Key on page 142.

Pelagomacellicephala iliffei agrees in a number of respects with *Gesiella jameensis,* found in a lava tunnel cave in the Canary Islands: both are short-bodied, translucent, with 9 pairs of delicate elytra, similar parapodia, and lack eyes. The pharynx of *G. jameensis* is of the usual polynoid type, with 9 pairs of papillae and 2 pairs of jaws without basal teeth; the pharynx of *P. iliffei* is unique, as indicated above. The prostomium of *P. iliffei* lacks lateral antennae, placing it in the Macellicephalinae; *G. jameensis* has small lateral antennae inserted ventrally, placing it in the Harmothoinae (Pettibone 1976:60) or in Gesiellinae, based on the unique accessory filamentous organs on the cirrophores of the dorsal cirri (Muir 1982:173).

Bathykermadeca Pettibone, 1976

Type-species.—*Macellicephala hadalis* Kirkegaard, 1956. Gender: feminine.

Diagnosis.—Segments 21. Elytra and elytrophores 9 pairs, on segments 2, 4, 5, 7, 9, 11, 13, 15, and 17. Prostomium deeply bilobed, conical anterior lobes with frontal filaments; ceratophore of median antenna inserted in anterior notch, with paired palps; without lateral antennae or eyes. Tentaculophores of tentacular segment lateral to prostomium, with 2 pairs of tentacular cirri and projecting acicular process, without setae. Dorsal cirri on non-elytra-bearing segments except segment 19 (lacks both elytra and dorsal cirri). Dorsal tubercles on cirrigerous segments inconspicuous or nodular. Parapodia biramous, both rami with elongate acicular processes, subequal in length. Notosetae subequal in length to and stouter than neurosetae, with 2 rows of spines and blunt tips. Neurosetae of 1 or 2 types. Posterior 4 segments somewhat modified and compressed. Pharynx with 7 pairs of dorsal and ventral papillae; 2 pairs of jaws with or without basal teeth.

A single species, *B. hadalis,* was previously referred to *Bathykermadeca,* as *Macellicephala hadalis* Kirkegaard, 1956, from South Pacific in the Kermadec Trench, in 6600–6720 meters. Additional records of this hadal species have been added by Levenstein (1978:165) from the Yap Trench in 8560–8720 meters, and by Levenstein (1982a:59) from the Japan Trench in 7350–7370 meters.

A new species from the North Atlantic is here added, *B. turnerae.*

Bathykermadeca turnerae, new species
Figs. 2, 3

Material examined.—North Atlantic off St. Croix, Virgin Islands, 17°57′36″N, 64°48′36″W, 3995 m, R. D. Turner Panel Study. Panels submerged on *Alvin* dive

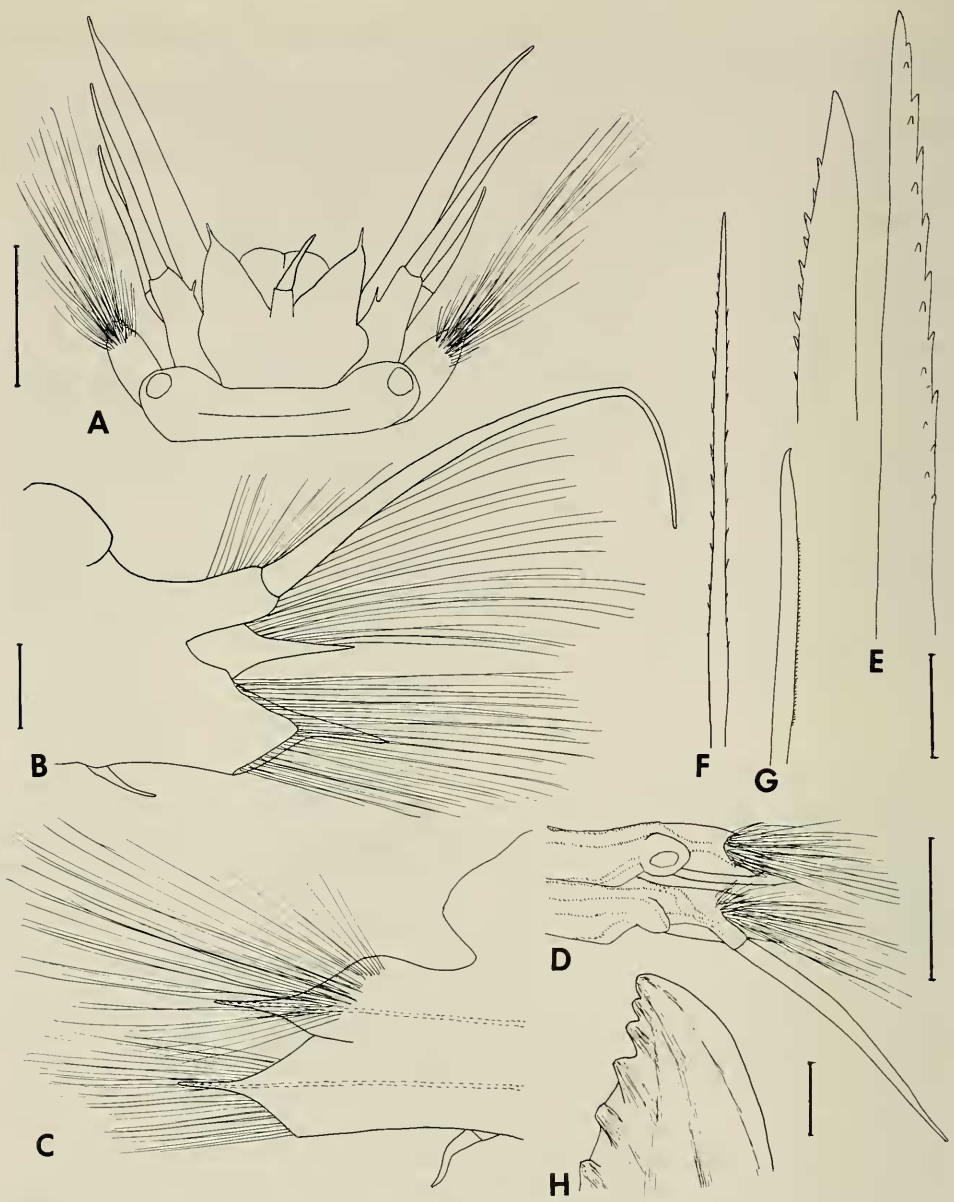

Fig. 2. *Bathykermadeca turnerae,* A, paratype, USNM 96246; B–G, holotype, USNM 96245; H, paratype, USNM 96247: A, Anterior end, dorsal view; B, Right cirrigerous parapodium, posterior view; C, Right elytrigerous parapodium, anterior view, acicula dotted; D, Right half of segments 7 and 8, dorsal view; E, Short and long notosetae; F, Supra-acicular neuroseta; G, Subacicular neuroseta; H, Jaw. Scales: = 1.0 mm for A; 0.5 mm for B, C; 2.0 mm for D; 0.1 mm for E–G; 0.1 mm for H.

873, 17 Dec 1978: P-4 removed on dive 1080, 7 Dec 1980, holotype (USNM 96245); P-5, P-13 removed dive 1079, 6 Dec 1980, 22 paratypes (USNM 96248); P-12 removed dive 1083, 7 Dec 1980, paratype (USNM 96246), 28 paratypes (USNM 96247).

North Atlantic, Bahamas, Tongue of the Ocean (TOTO), 24°53′12″N,

77°40′12″W, 2066 m, R. D. Turner Panel Study: Panel T-A submerged on *Alvin* dives 492, 493, 20, 21 Jan 1974; removed dive 751, 8 May 1977, paratype (USNM 69249).—Panel T-1 submerged dive 552, 19 Apr 1975; removed dive 753, 10 May 1977, paratype (USNM 96250).—Panel 4A/T86 submerged dive 563, 6 May 1975; removed dive 753, 10 May 1977, paratype (USNM 96251).—Panel T-16 submerged dive 564, 8 May 1975; removed dive 755, 12 May 1977, 4 paratypes (USNM 96253).—Panels T-17, T-18 submerged dive 564, 8 May 1975; removed dive 752, 9 May 1977, 8 paratypes (USNM 96254).—Panel T-20 submerged dive 564, 8 May 1975; removed dive 755, 11 May 1977, 4 paratypes (USNM 96255).—Panels T-37, T-56 submerged dives 752, 755, 9, 12 May 1977; removed dive 851, 11 Nov 1978, 8 paratypes (USNM 96256).—Panels T-15, T-36 submerged dives 752, 755, 9, 12 May 1977; removed dive 852, 12 Nov 1978, 5 paratypes (USNM 96252).—Panel T-85, no data, paratype (96257).

North Atlantic Deep Ocean Stations (DOS), R. D. Turner Panel Study: DOS-1, 110 miles south of Woods Hole, Massachusetts, 39°46′N, 70°41′W, 1830 m: Panel N-34 submerged on *Alvin* dive 597, 30 Aug 1975; removed dive 773, 29 Jul 1977, 2 paratypes (USNM 96258).—DOS-2, 190 miles SE of Woods Hole, 38°18′24″N, 69°35′36″W, 3506 m: Panel N-42 submerged dive 602, 6 Sep 1975; removed dive 792, 26 Sep 1977, 4 small paratypes (USNM 96259).—Panels N-45, N-62 submerged dives 657, 681, 10 Jun, 12 Aug 1976; removed dive 790, 23 Sep 1977, 5 small paratypes (USNM 96260: Panel N-95 submerged dive 817, 29 Jun 1978; removed dive 1026, 27 Jun 1980, paratype (USNM 96261).

Description.—Length of holotype (USNM 96245), largest specimen from off St. Croix, 17 mm, width including setae 11 mm, segments 21, last 2 very small. Largest paratype from Deep Ocean Station south of Woods Hole (USNM 96258) 14 mm long, 10 mm wide, with 21 segments. Smallest young paratype from off Bahamas (USNM 96255) 1 mm long, 1.2 mm wide, with 12 segments plus bulbous growing zone. Body oval, greatly flattened, tapering anteriorly and posteriorly, with very long parapodia and setae projecting posteriorly. No color. Dorsum with transverse ciliated bands, up to 4 per segment, continuing on bases of elytrophores and dorsal tubercles (Fig. 2D).

Elytrophores 9 pairs, large, bulbous, on segments 2, 4, 5, 7, 9, 11, 13, 15, and 17 (Figs. 2A, C, D; 3B). Elytra large, oval, covering dorsum, opaque white, without tubercles or papillae, sometimes with slightly undulate posterior border; first elytra with small anterior notch (Fig. 3G, H). Dorsal cirri and nodular dorsal tubercles on segments 3, 6, 8, 10, 12, 14, 16 (Fig. 2B, D). Parapodia of posterior segments (18–21) somewhat modified and compressed (Fig. 3A–F; see below).

Prostomium deeply bilobed, anterior lobes conical, with frontal filaments; median antenna with short cylindrical ceratophore and short tapered style; palps long, stout, tapered (Fig. 2A). Tentacular segment not distinct dorsally; tentaculophores with delicate acicular process on inner side; pair of long dorsal and ventral tentacular cirri, ventral ones shorter than dorsal; prominent bilobed facial tubercle anterior to prostomium (Fig. 2A). Second or buccal segment with first pair of large elytrophores, well-developed biramous parapodia and ventral or buccal cirri similar to tentacular cirri, with short cirrophores on basal part of neuropodia lateral to ventral mouth. Pharynx with 7 pairs of subequal papillae around opening; 2 pairs of dark reddish-striped jaws with 5 teeth on edge (Fig. 2H).

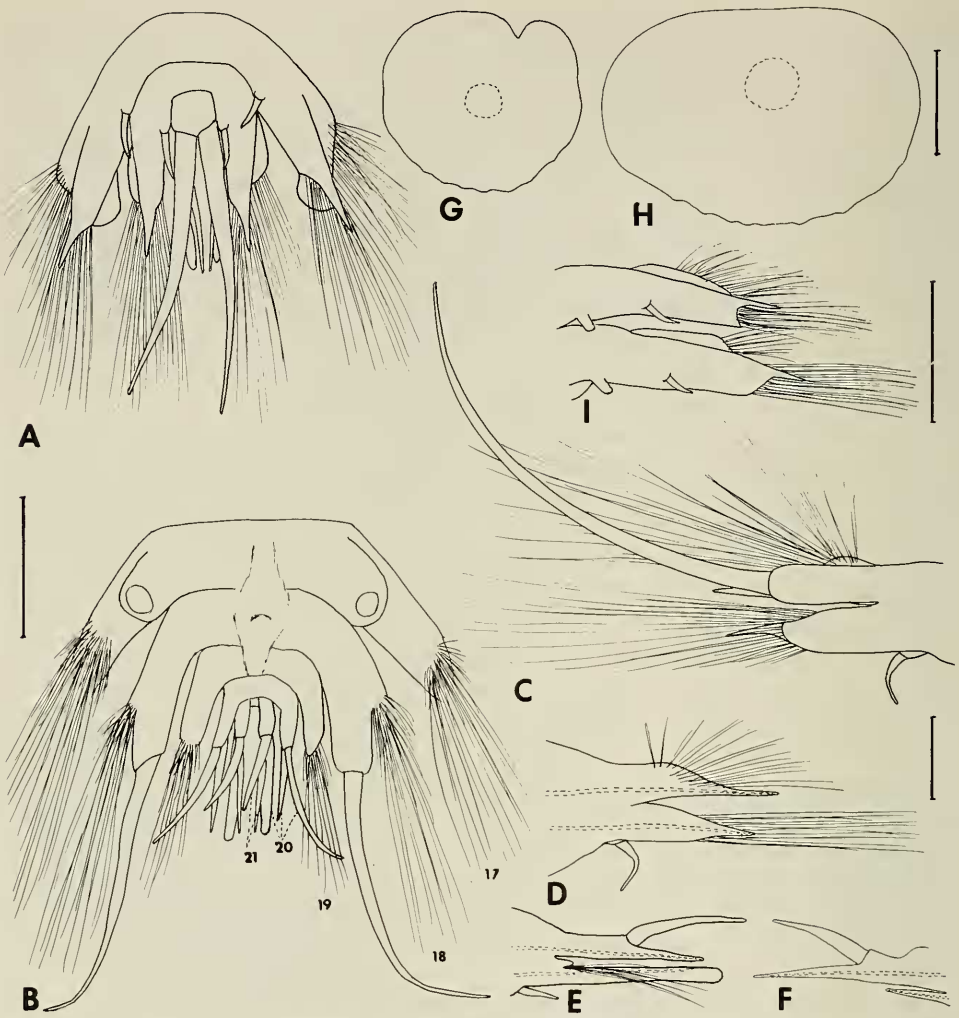

Fig. 3. *Bathykermadeca turnerae,* A–F, holotype, USNM 96246; G–I, paratype, USNM 96247: A, Ventral view posterior end including segments 18–21 (parapodia of 20 and 21 mostly hidden from view); B, Dorsal view posterior end including segments 17–21; C, Left cirrigerous parapodium of segment 18, posterior view; D, Left parapodium of segment 19, anterior view, acicula dotted; no elytrophore or dorsal cirrus present; E, Left parapodium of segment 20, anterior view, acicula dotted; F, Left parapodium of segment 21, posterior view, acicula dotted; G, First right elytron; H, Middle right elytron; I, Ventral view of left half of segments 12 and 13 showing segmental papillae. Scales: = 1.0 mm for A, B; 0.5 mm for C–F; 1.0 mm for G, H; 2.0 mm for I.

Parapodia long (Fig. 2B, C). Notopodia well developed, conical, with long projecting acicular process on lower side, almost as long as neuropodia. Notosetae numerous, forming radiating bundle, short to long, as long as and much stouter than neurosetae, acicular, nearly straight, with blunt bare tips and 2 rows of widely-spaced spines on distal part (Fig. 2E). Neuropodia subconical, with projecting acicular process on anterior lobe; posterior lobe shorter, rounded. Neurosetae very numerous, long, slender, of 2 types: supra-acicular ones with widely-spaced spines

along lateral borders and tapered pointed tips (Fig. 2F); subacicular ones with numerous close-set spines along basal two-thirds and slightly hooked bare tips (Fig. 2G). Dorsal cirri with elongate cylindrical cirrophores attached on posterior sides of notopodia; styles long, slender, smooth, with tapered tips, extending beyond tips of setae (Fig. 2B). Ventral cirri short, tapered, attached on middle of neuropodia (Fig. 2B, C).

Segments posterior to elytrigerous segment 17 somewhat modified and compressed (Fig. 3A, B). Parapodia of segment 18 similar to more anterior cirrigerous parapodia with long dorsal cirri, except for absence of dorsal tubercles; parapodia long, directed posteriorly and enclosing shorter parapodia of segments 19–21 (Fig. 3A–C). Segment 19 lacking both elytrophores and dorsal cirri; small biramous parapodia enclosing still smaller parapodia of segments 20 and 21 (Fig. 3A, B, D). Parapodia of segment 20 with cirrophore of dorsal cirrus with short style, fused to projecting notopodial acicular process, without notosetae; neuropodium with tongue-like acicular lobe, rounded distally, with small bundle of slender neurosetae and small ventral cirrus (Fig. 3E). Notopodia of segment 21 similar to segment 20, neuropodia represented by small acicular lobe, lacking neurosetae and ventral cirrus (Fig. 3F).

Anal ridge visible on dorsal side of segments 17 to 19, with anal opening on segment 18 (Fig. 3B). Pygidium small squarish lobe between bases of parapodia 19 and ventral to parapodia of 20 and 21, with pair of long anal cirri (Fig. 3A). Four pairs of small segmental or nephridial papillae on ventral side of segments 12–15 (Fig. 3I).

Distribution.—North Atlantic, off St. Croix, Virgin Islands, off the Bahamas, and south and southeast of Woods Hole, Massachusetts, in depths from 1830 to 3995 meters, associated with wood panels. See Introduction.

Etymology.—The species is named for Dr. Ruth D. Turner, whose interesting *Alvin* Deep-sea Wood and Panel Experiments furnished the specimens on which this study is based.

Comparisons.—*Bathykermadeca turnerae* agrees in most respects with *B. hadalis* (Kirkegaard), including the presence of the four posteriormost segments being somewhat modified and compressed, and with both elytrophores and dorsal cirri lacking on segment 19. They may be separated, however, on the following characters:

	B. hadalis (Kirkegaard)	*B. turnerae,* n. sp.
Dorsal tubercles	Inconspicuous	Nodular
Neurosetae	One type	Two types
Jaws	Without basal teeth	With basal teeth
Nephridial papillae	6 large pairs on segments 12–17	4 small pairs on segments 12–15

Bathykermadeca turnerae may be separated from the other two species of Macellicephalinae described herein according to the Key on page 142.

Bathybahamas, new genus

Type-species.—*Bathybahamas charleneae,* new species. Gender: feminine.

Diagnosis.—Segments 18. Elytra and elytrophores 8 pairs, on segments 2, 4, 5,

7, 9, 11, 13, and 15. Bilobed prostomium with blunt anterior peaks, without frontal filaments, with median antenna and palps, without lateral antennae or eyes. Tentaculophores of tentacular segment with 2 pairs of tentacular cirri and projecting acicular process, without setae. Facial tubercle trilobed. Dorsal cirri on non-elytra-bearing segments, with long styles; dorsal tubercles on cirrigerous segments with digitiform ciliated extensions. Parapodia long, biramous, both rami with projecting acicular processes, subequal in length. Notosetae numerous, subequal in length to and stouter than neurosetae, with single row of teeth. Neurosetae numerous, slender, of 2 types. Ventral cirri short, long on segment 2. Pharynx with 7 pairs of papillae; 2 pairs of jaws entire, without basal teeth.

Etymology.—*Bathy,* from *bathys,* Greek, deep, plus *bahamas,* referring to the locality in the deep Atlantic off the Bahama Islands plus s ending. Gender: feminine.

Bathybahamas charleneae, new species
Fig. 4

Material examined.—North Atlantic, Tongue of the Ocean (TOTO) off the Bahama Islands, 24°53′12″N, 77°40′12″W, 2066 m, R. D. Turner Panel Study: Panel T-1 submerged *Alvin* dive 552, 19 Apr 1975; removed dive 753, 10 May 1977, paratype, USNM 96244.—Panel T-16 submerged dive 564, 8 May 1975; removed dive 755, 12 May 1977, holotype, USNM 96243.

Description.—Length of holotype 8 mm, width 6 mm including setae, segments 18. Paratype 9 mm long, 7 mm wide. Body oval, flattened dorsoventrally, with very long parapodia and setae extending laterally and posteriorly. Color: Anterior third of dorsum brownish; pharynx with dark brown lining. Dorsum with transverse ciliated bands, 2 per segment, extending onto elytrophores and dorsal tubercles.

Elytrophores large, bulbous, 8 pairs, on segments 2, 4, 5, 7, 9, 11, 12, and 15, with dorsal cirri on 3 posterior smaller segments (Fig. 4A, B). Elytra all missing. Dorsal tubercles on cirrigerous segments with digitiform ciliated extensions projecting laterally (Fig. 4C).

Prostomium deeply bilobed, with blunt anterior peaks; median antenna with large ceratophore in middle of prostomium, with long style; palps stout, long, tapered (Fig. 4A, H). Tentacular segment not distinct dorsally; tentaculophores lateral to prostomium, with prominent acicular process on inner side, without setae, with pair of long dorsal and ventral tentacular cirri; trilobed facial tubercle anterior to prostomium (Fig. 4A, H). Second or buccal segment with first pair of large elytrophores, well-developed biramous parapodia and ventral or buccal cirri similar to tentacular cirri, with short cirrophores on basal part of neuropodia lateral to ventral mouth (Fig. 4A). Pharynx with 7 pairs of subequal papillae around opening; 2 pairs of jaws without extra basal teeth (Fig. 4D).

Parapodia long, biramous (Fig. 4B, C). Notopodia round, with long projecting acicular process on lower side, almost as long as neuropodia. Notosetae numerous, forming radiating bundle, short to long, nearly as long as and stouter than neurosetae, slightly curved, with blunt tips and single row of widely-spaced teeth along one side (Fig. 4E). Neuropodia conical, with long projecting acicular process on anterior lobe; posterior lobe slightly shorter, rounded. Neurosetae numerous, long, slender, of 2 types: supraacicular ones slightly stouter, flattened, with widely-

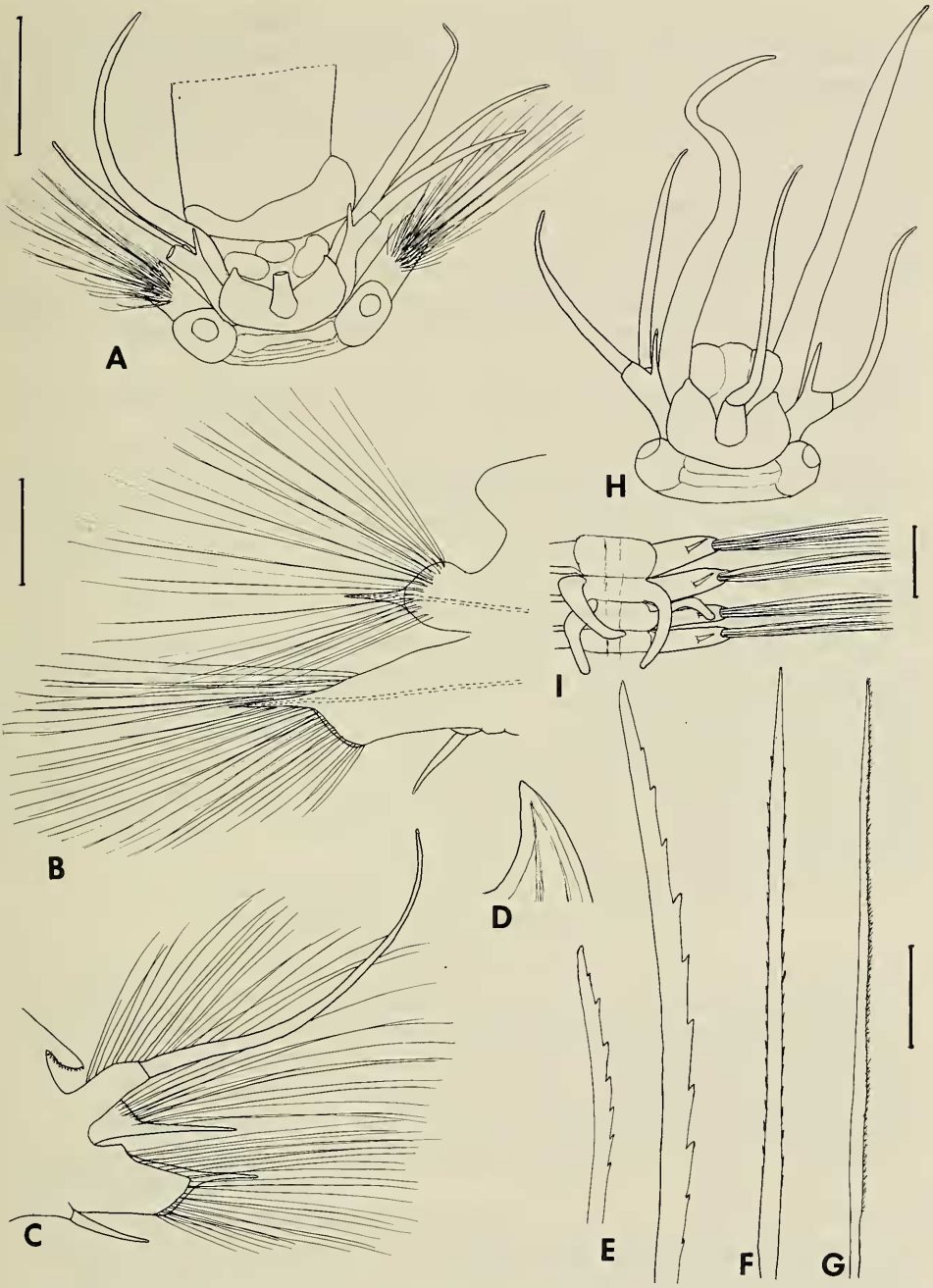

Fig. 4. *Bathybahamas charleneae,* A–G, holotype, USNM 96243; H, I, paratype, USNM 96244: A, Dorsal view anterior end, pharynx completely extended, only basal part shown; styles of median antenna and left dorsal tentacular cirrus missing; B, Right elytrigerous parapodium, anterior view, acicula dotted; C, Right cirrigerous parapodium, posterior view; D, Isolated jaw; E, Short and long notosetae; F, Supra-acicular neuroseta; G, Subacicular neuroseta; H, Dorsal view anterior end, pharynx partially extended; right ventral tentacular cirrus missing; parapodia of segment 2 not shown; I, Ventral view of segments 11–14 showing elongate papillae on 12 and 13. Scales: = 1.0 mm for A, H; 0.5 mm for B, C; 0.1 mm for D–G; 1.0 mm for I.

spaced serrations on lateral sides and pointed bare tips (Fig. 4F); subacicular neurosetae slender, with numerous faint, fine, close-set hairs or spines along one side, tapering distally with delicate hairs (Fig. 4G). Dorsal cirri with elongate cylindrical cirrophores on posterior side of notopodia; styles long, slender, extending beyond setae (Fig. 4C). Ventral cirri short, tapered, in middle of neuropodia (Fig. 4B, C).

Pygidium small lobe nearly hidden by parapodia and setae of posterior segments. Small ventral segmental papillae on segments 6–15 on holotype. Paratype with 2 pairs of elongate ventral papillae on segments 12 and 13 (Fig. 4I).

Distribution.—North Atlantic off the Bahamas, in 2066 meters depth, associated with wood panels and with much more abundant polynoid, *Bathykermadeca turnerae.*

Etymology.—The species is named for Charlene D. Long, who made preliminary identifications of this and many other polynoid polychaetes.

Comparisons.—*Bathybahamas* differs from the four previously described genera of the Macellicephalinae also possessing 8 pairs of elytra; i.e. *Bruunilla* Hartman, 1971 (emended Pettibone 1979), *Bathyeliasona* Pettibone, 1976, *Bathyvitiazia* Pettibone, 1976, and *Bathypolaria* Levenstein, 1981, in having neurosetae of 2 types, instead of a single type, in having notopodia of the biramous parapodia subequal in length to the neuropodia, instead of considerably shorter, and in having dorsal tubercles with digitiform branchial processes, instead of lacking them. This latter feature is present also in *Bathyfauvelia* Pettibone, 1976 (with 9 pairs of elytra) and *Bathycatalina* Pettibone, 1976 (with 12 pairs of elytra) (see Key below). *Bathybahamas* lacks (1), the characteristic wing-like structure on the ventral side of the lower lip of *Bruunilla,* (2), the keel-like pygidium of *Bathypolaria,* (3), the jaws with basal teeth of *Bathyvitiazia* and *Bruunilla* and (4), the different type of notosetae of *Bathyeliasona.* The five genera with 8 pairs of elytra can be separated according to the following Key.

Key to the Genera of Macellicephalinae
with 8 Pairs of Elytra

1. With pair of wing-like structures on ventral side of segments 2 and 3 (lower lip); trilobed facial tubercle (fig. 1b, in Pettibone 1979). Prostomium rounded, without anterior projections and frontal filaments (fig. 1a, in Pettibone 1979). Jaws with basal teeth (fig. 2c, in Pettibone 1979). Notopodia much shorter than neuropodia (fig. 2a, b, in Pettibone 1979) .. .. *Bruunilla* Hartman, 1971 (emend. Pettibone, 1979)
B. natalensis Hartman, 1971
(Mozambique Basin, 4886–5068 m depth)
– Without pair of wing-like structures on ventral side on lower lip 2
2. Dorsal tubercles with lateral digitiform branchial extensions (Fig. 4C). Notopodia subequal in length to neuropodia (Fig. 4B, C). Neurosetae of 2 types (Fig. 4F, G). Prostomium with projecting blunt peaks, without frontal filaments; facial tubercle trilobed; tentaculophores with prominent acicular process, without setae (Fig. 4A, H). Jaws of pharynx without basal teeth (Fig. 4D) ..... *Bathybahamas,* new genus
B. charleneae, new species
(Off Bahamas, 2066 m depth)

– Dorsal tubercles indistinct, not forming digitiform branchial structures. Notopodia much shorter than neuropodia. Neurosetae of single type ... 3

3. Prostomium with projecting anterior lobes and frontal filaments; tentaculophores with transverse row of setae (fig. 14a, b, in Pettibone 1976). Jaws of pharynx without basal teeth. Neurosetae flattened, greatly expanded, with close-set lateral serrations (fig. 13e, in Pettibone 1976 .... *Bathyeliasona* Pettibone, 1976
B. abyssicola (Fauvel, 1913)
(Bay of Biscay, 4380 m depth)

– Prostomium rounded, without projecting anterior lobes and frontal filaments; tentaculophores without setae (fig. 20a in Pettibone 1976; fig. 1a in Levenstein 1981). Neurosetae not greatly expanded, with widely spaced spines along lateral sides (fig. 20h in Pettibone 1976; fig. 1e in Levenstein 1981) 4

4. Jaws of pharynx with numerous teeth (fig. 20c in Pettibone 1976). Segments 17. Notosetae slender, delicate, flattened, with serrations along lateral borders (fig. 20g in Pettibone 1976). Pygidium oval (fig. 20b in Pettibone 1976) ..... *Bathyvitiazia* Pettibone, 1976
B. pallida (Levenstein, 1971)
(Kamchatka Trench, 3816 m depth)

– Jaws of pharynx without teeth. Segments 15. Notosetae thick, toothed along one side (fig. 1d in Levenstein 1981). Pygidium prominent, keel-like (fig. 1b in Levenstein 1981) ..... *Bathypolaria* Levenstein, 1981
B. carinata Levenstein, 1981
(Canadian Arctic, 2750–3920 m depth)

Key to Macellicephalinae with Dorsal Tubercles Forming Cirriform Ciliated Branchial Structures

1. Notopodia shorter than neuropodia (fig. 21e in Pettibone 1976). Elytra 9 pairs, segments 19–21. Neurosetae of single type, flattened, paddle-like (fig. 22e in Pettibone 1976). Notosetae with numerous spinous rows (fig. 22d in Pettibone 1976) ..... *Bathyfauvelia* Pettibone 1976
B. affinis (Fauvel, 1914)
(Off Madeira, 0–2380 m depth)

– Notopodia subequal in length to neuropodia (Fig. 4B, C; fig. 23c in Pettibone 1976) 2

2. Elytra 12 pairs, segments 24. Neurosetae of single type, flattened, paddle-like (fig. 23e in Pettibone 1976). Notosetae with numerous spinous rows (fig. 23d in Pettibone 1976) ..... *Bathycatalina* Pettibone, 1976
B. filamentosa (Moore, 1910)
(Off Santa Catalina Is., 611–1097 m depth)

– Elytra 8 pairs, segments 18. Neurosetae of 2 types, not flattened, paddle-like (Fig. 4F, G). Notosetae serrated along edge (Fig. 4E) .... *Bathybahamas,* new genus
B. charleneae, new species
(Off Bahamas, 2066 m depth)

Key to Three Species of Macellicephalinae from North Atlantic Reported Herein

1. Elytra 8 pairs. Segments 18. Dorsal tubercles with lateral digitiform ciliated extensions (Fig. 4C). Prostomium with blunt anterior peaks, without frontal filaments, with long median antenna (Fig. 4H). Tentaculophores with projecting acicular process, without setae; facial tubercle trilobed (Fig. 4A, H). Parapodia with notopodia and neuropodia subequal in length (Fig. 4C). Pharynx with 7 pairs of subequal papillae; jaws without basal teeth. Without long ventral segmental papillae or with 2 pairs of elongate papillae on segments 12 and 13 (Fig. 4I) . . *Bathybahamas charleneae,* n. gen., n. sp.
– Elytra 9 pairs. Segments 19–21. Dorsal tubercles short, nodular (Figs. 1D, 2B, D). Facial tubercle bilobed (Figs. 1A, 2A). Jaws of pharynx with basal teeth (Figs. 1I, 2H) 2
2. Prostomium with conical anterior lobes with frontal filaments, with short median antenna (Fig. 2A). Tentaculophores with small acicular process, without setae (Fig. 2A). Parapodia with notopodia and neuropodia subequal in length (Fig. 2C). Pharynx with 7 pairs of subequal papillae; jaws with basal teeth (Fig. 2H). Posterior segments (18–21) modified and compressed, without elytra or dorsal cirri on segment 19 (Fig. 3B, D). Four pairs of ventral segmental papillae on segments 12–15 (Fig. 3I) ..... *Bathykermadeca turnerae,* n. sp.
– Prostomium with rounded anterior lobes, without frontal filaments, with long median antenna (Fig. 1A). Tentaculophores without acicular process or setae (Fig. 1A). Parapodia with notopodia much shorter than neuropodia (Fig. 1C). Pharynx with 5 pairs of papillae, median ones extra long, lateral ones small; jaws with more numerous basal teeth (11–15) (Fig. 1H, I). Posterior segments not modified, with dorsal cirri on segment 19 (Fig. 1B). Ventral segmental papillae indistinct, none enlarged ..... *Pelagomacellicephala iliffei,* n. gen., n. sp.

Subfamily Harmothoinae Horst, 1917

Genus *Harmothoe* Kinberg, 1856

Type-species.—*Harmothoe spinosa* Kinberg, 1856. Gender: feminine.

Diagnosis.—Segments up to 45. Elytra and elytrophores 15 pairs, on segments 2, 4, 5, 7, alternate segments to 23, 26, 29, and 32. Dorsal cirri on non-elytra-bearing segments. Nodular dorsal tubercles on cirrigerous segments. Elytra with microtubercles, with or without macrotubercles. Bilobed prostomium with cephalic peaks, 3 antennae and paired palps; lateral antennae with distinct ceratophores, inserted ventral to ceratophore of median antenna; usually with 2 pairs of eyes. Tentaculophores of tentacular segment lateral to prostomium, with small acicular process, with or without setae, with 2 pairs of tentacular cirri. Parapodia biramous, both rami with elongate acicular processes; neuropodia usually with supra-acicular digitiform process. Notosetae as stout as or stouter than neurosetae, with well-marked spinous rows and blunt to pointed tips. Neurosetae with elongate spinous regions, with tips slightly hooked, at least some with secondary subterminal tooth. Pharynx with 9 pairs of papillae and 2 pairs of hooked jaws, without basal teeth.

Table 2.—Records of *Harmothoe ingolfiana* from Deep Ocean Stations (DOS).

Panel	Submerged *Alvin* dive	Removed *Alvin* dive	Number specimens	USNM cat. no.
DOS-1				
N24, N27	597 30 Aug 75	658 15 Jun 76	20	81248
N26, N28	597 30 Aug 75	685 17 Aug 76	14	81231
N28	597 30 Aug 75	794 28 Sep 77	11	81232
N34	597 30 Aug 75	773 29 Jun 77	39	81250
N35	597 30 Aug 75	834 18 Sep 78	9	81233
N47	658 15 Jun 76	774 30 Jul 77	18	81234
N54	658 15 Jun 76	794 28 Sep 77	10	81235
N74	774 30 Jul 76			
N54	658 15 Jun 76	794 28 Sep 77	21	81236
N65	685 17 Aug 76	773 29 Jul 77	10	31237
N67	685 17 Aug 76	776 1 Aug 77	15	81238
N72	773 29 Jul 77	834 18 Sep 78	160	81251
N99	834 18 Sep 78	1026 27 Jul 80	45	81239
DOS-2				
N31, N39	601 5 Sep 75	777 3 Aug 77	100	81249
N37	601 5 Sep 75	681 13 Aug 76	4	81240
N40	601 5 Sep 75	657 10 Aug 76	10	81241
N42	602 6 Sep 75	792 26 Sep 77	1	81242
N44	657 10 Jun 76	790 23 Sep 77	4	81243
N45	657 10 Jun 76	790 23 Sep 77	5	81244
N62	681 13 Aug 76			
N50	657 10 Jun 76	778 4 Aug 77	11	81245
N63	681 13 Aug 76			
N60	681 13 Aug 76	817 29 Jun 78	5	81246
N82, N83	790 23 Sep 77	1031 3 Aug 80	43	81252
N95	817 29 Jun 78	1026 17 Jul 80	1	81247

Two species of *Harmothoe* are covered in this report: *H. ingolfiana* Ditlevsen, 1917, and *H. vagabunda,* new species.

Harmothoe ingolfiana Ditlevsen
Fig. 5

Harmothoe ingolfiana Ditlevsen, 1917:32, pl. 1: figs. 12, 14, pl. 2: fig. 15, text-fig. 15a–d.—Wesenberg-Lund, 1950:8.—Wolff, 1979:117, 120, 123–124.

Material examined.—North Atlantic, south of Iceland, 61°30′N, 22°30′W, 1836 m, *Ingolf*-Exped. sta 67, 10 syntypes (ZMC).

North Atlantic Deep Ocean Stations (DOS), R. D. Turner Panel Study: DOS-1, 110 miles south of Woods Hole, Massachusetts, 39°46′N, 70′41′W, 1830 m, 372 specimens, including many young (USNM; see Table 2). DOS-2, 190 miles southeast of Woods Hole, 38°18′24″N, 69°35′36″W, 3506 m, 184 specimens, including many young (USNM; see Table 2).

Description.—Length of complete syntype 12 mm, width with setae 5 mm, segments 36. Length of incomplete syntype of 16 segments 9 mm, width 8 mm. Three specimens from DOS-1 (USNM 81248) 32–33 mm long, 13–15 mm wide, segments 38–39. No color.

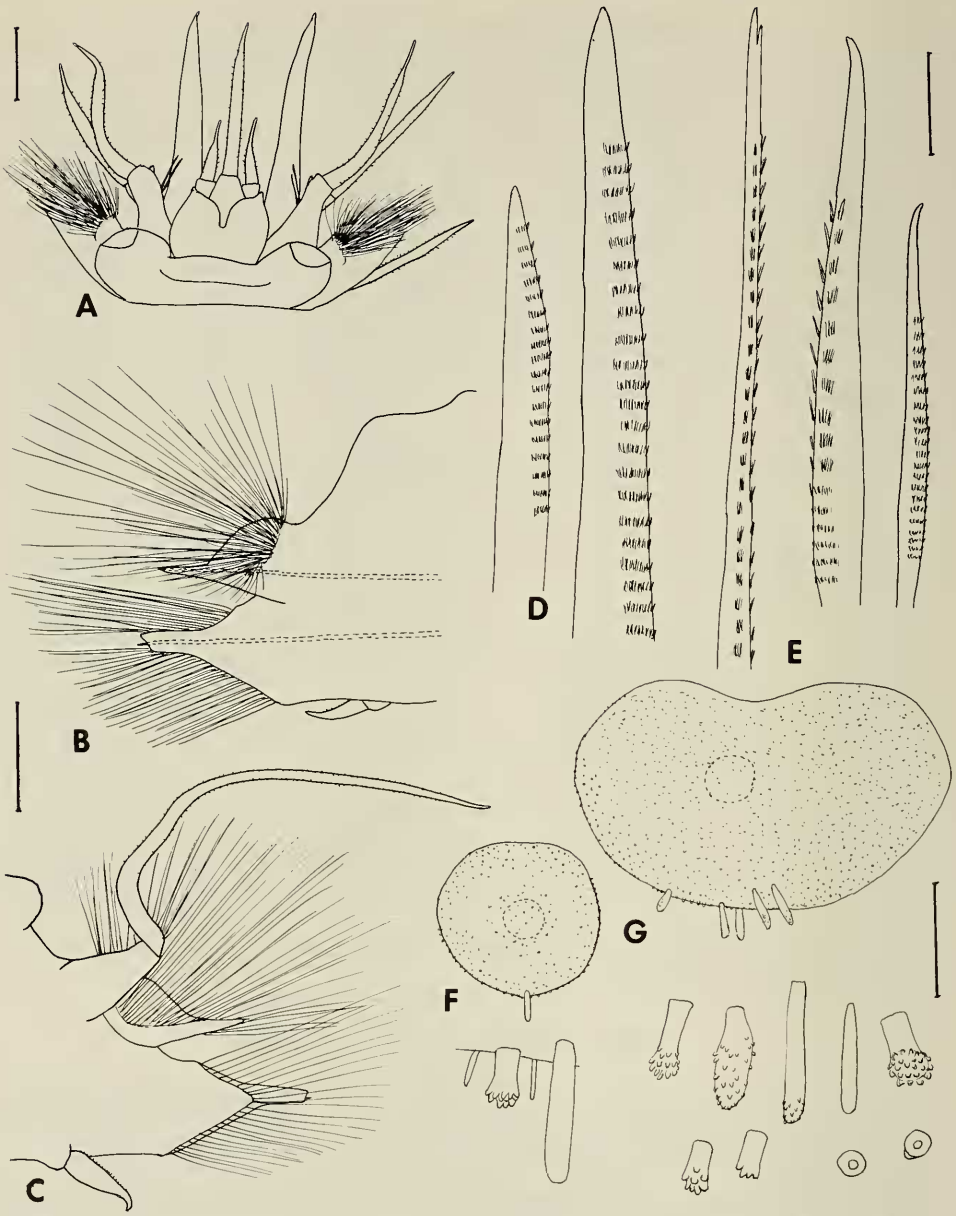

Fig. 5. *Harmothoe ingolfiana,* USNM 81248: A, Anterior end, dorsal view; B, Right elytrigerous parapodium, anterior view, acicula dotted; C, Right cirrigerous parapodium, posterior view; D, Short and long notosetae; E, Upper, middle and lower neurosetae; F, First elytron, with detail of microtubercles, macrotubercles and papillae; G, Middle left elytron with detail of same. Scales: = 1.0 mm for A; 1.0 mm for B, C; 0.1 mm for D, E; 2.0 mm for F, G.

Body flattened, subrectangular, tapered slightly anteriorly and posteriorly. Elytra 15 pairs, large, covering dorsum, circular, oval to subreniform in shape, densely covered with small, conical microtubercles, becoming larger near lateral and posterior borders, with multispinous tips; some elytra with few macrotubercles near

posterior border, cylindrical to oval, smooth or spinous distally (Fig. 5F, G; pl. 1: figs. 12, 14, in Ditlevsen 1917). Elytrophores large, bulbous (Fig. 5A, B). Dorsal cirri on non-elytra-bearing segments; dorsal tubercles on cirrigerous segments nodular (Fig. 5C).

Prostomium bilobed, with cephalic peaks; median antenna with stout ceratophore in anterior notch, with long style, minutely papillate; lateral antennae with short stout ceratophores inserted ventrally, with short styles, minutely papillate; palps stout, tapered, smooth; without eyes (Fig. 5A; pl. 2: fig. 15, in Ditlevsen 1917). Tentaculophores lateral to prostomium, with small acicular process, 2–3 setae and dorsal and ventral tentacular cirri similar to median antenna (Fig. 5A). Facial tubercle not distinct, with facial ridge. Second or buccal segment with first pair of large elytrophores, biramous parapodia and long ventral buccal cirri inserted basally on neuropodia lateral to ventral mouth, similar to tentacular cirri (Fig. 5A).

Parapodia biramous (Fig. 5B, C; text-fig. 14, in Ditlevsen 1917). Notopodia smaller than neuropodia, rounded, with acicular process on lower side. Notosetae numerous, forming radiating bundle, short to long, stouter and as long or longer than neurosetae, straight, sword-shaped, reddish amber-colored, with prominent transverse spinous rows and rather long bare tapered tips (Fig. 5D; text-fig. 15a, in Ditlevsen 1917). Dorsal cirri with cylindrical cirrophores on dorsoposterior side of notopodia; styles slender, extending beyond setae, with scattered micropapillae (Fig. 5C). Neuropodia conical, with presetal acicular process, with only small supra-acicular extension (without digitiform supra-acicular process, as usual in *Harmothoe*). Upper neurosetae more slender, with longer spinous regions and bifid tips; middle and lower neurosetae stouter, with entire bare tips and shorter spinous regions (Fig. 5E). All neurosetae with bifid tips in smaller specimens (text-fig. 15b–d, in Ditlevsen 1917). Ventral cirri short, subulate, with micropapillae on upper part (Fig. 5B, C).

Pharynx with 9 pairs of papillae and 2 pairs of hooked jaws. Nephridial papillae small, beginning on segment 6. Pygidium small, bulbous, with pair of anal cirri.

Distribution.—North Atlantic, south of Iceland to off New England, in 1830 to 3506 meters depth. In burrows of wood-boring bivalves (Xylophagainae).

Remarks.—The original material of *H. ingolfiana,* described by Ditlevsen (1917), was collected from *Ingolf*-Expedition station 67 south of Iceland in 1783 meters (975 fms), corrected by Wesenberg-Lund (1950:8) to 1836 meters. Ditlevsen (1917:33) remarked "that it is a pronounced deep-sea form, is beyond doubt." In connection with his study on "Macrofaunal Utilization of Plant Remains in the Deep Sea," Wolff (1979:117, 120, 123–124) reported that "A log of pine wood, several meters long, was collected at 1800 m in the North Atlantic (K. W. Ockelmann, pers. comm.)" and "A *Xylophaga*-bored piece of a pine log, c. 15 × 35 cm, from *Ingolf* st. 67 in the North Atlantic (1836 m)" contained a number of polychaetes with preliminary identifications by the late A. Eliason. Among them was *Harmothoe ingolfiana,* described by Ditlevsen from the same *Ingolf* station. Thus it appears safe to assume that the syntypes of *H. ingolfiana* were associated with the boring bivalves (*Xylophaga*) in wood. The numerous specimens, from young to adult, identified as *H. ingolfiana* in the wood panel study by Ruth Turner in the North Atlantic, indicate that it is an opportunistic species, using the wood and animal associates as a substrate, as well as a source of food. Numerous

specimens of the ampharetid polychaete, *Decemunciger apalea,* were described by Zottoli (1982) from the same wood panels.

Harmothoe vagabunda, new species
Fig. 6

Material examined.—North Atlantic, Tongue of the Ocean (TOTO), off Bahama Islands, 24°53′12″N, 77°40′12″W, 2066 m, R. D. Turner Panel Study, submerged on *Alvin* dive 564, 8 May 75; panels T-16, T-17, T-20 removed on dives 752, 754, 9–12 May 77, 7 paratypes, USNM 81227–81229.

Off St. Croix, Virgin Islands, 17°57′36″N, 64°48′36″W, 3995 m, R. D. Turner Panel Study, submerged on *Alvin* dive 873, 17 Dec 78; P-3 removed on dive 1080, 7 Dec 80, paratype (USNM 81226); P-5, P-13 removed on dive 1079, 6 Dec 80, 20 small paratypes, USNM 81225. *Alvin* dives 875, 876, 19, 20 Dec 78, picked up pieces of "wild" wood, about 5 and 6 feet long, holotype, USNM 81223 and 15 paratypes, USNM 81224.

Description.—Length of holotype from off St. Croix (USNM 81223) 13 mm, width with setae 6 mm, segments 35; paratype (USNM 81224) 9 mm long, 4 mm wide, with 34 segments. Length of paratype from off Bahamas (USNM 81228) 10 mm, width 5 mm, segments 31, last 4 smaller, regenerating. No color.

Body flattened, slightly tapered anteriorly and posteriorly. Elytra 15 pairs, large, covering dorsum, oval, soft, opaque white, nearly covered with conical microtubercles, low, oval on anterior part; some scattered cylindrical papillae on surface and on lateral borders but without long fringe of papillae (Fig. 6F). Elytrophores large, bulbous (Fig. 6A, B). Dorsal cirri on non-elytra-bearing segments; dorsal tubercles nodular (Fig. 6C).

Prostomium bilobed, rounded, with cephalic peaks very small or indistinct; median antenna with large ceratophore in anterior notch, with style about 2 times longer than prostomium having scattered short papillae and slender tip; lateral antennae with rather large bulbous ceratophores inserted ventrally, with styles short and subulate; palps stout, tapered, slightly longer than median antenna; without eyes (Fig. 6A). Tentaculophores lateral to prostomium, with small acicular process and 2–4 setae on inner side; dorsal tentacular cirri about same length as median antenna, ventral ones shorter; raised facial ridge but without distinct facial tubercle. Second or buccal segment with pair of large bulbous elytrophores, biramous parapodia and long ventral buccal cirri inserted basally on neuropodia lateral to ventral mouth, similar to tentacular cirri (Fig. 6A).

Parapodia biramous (Fig. 6B, C). Notopodia smaller than neuropodia, rounded, with acicular process on lower side. Notosetae numerous, forming radiating bundle, short to long, much stouter than and slightly shorter than neurosetae, slightly curved, with spinous rows and tapered pointed bare tips (Fig. 6D). Dorsal cirri with cylindrical cirrophores on dorsoposterior side of notopodia; styles slender, extending beyond setae, with scattered short papillae and slender terminal filament (Fig. 6C). Neuropodia conical with longer presetal acicular process; postsetal lobe shorter, rounded. Neurosetae numerous, forming fan-shaped bundle. Upper neurosetae longer, more slender, with longer spinous regions and bifid split tips; lower neurosetae shorter, stouter, with tips slightly curved, with slender secondary tooth (Fig. 6E). Ventral cirri short, tapered (Fig. 6B, C).

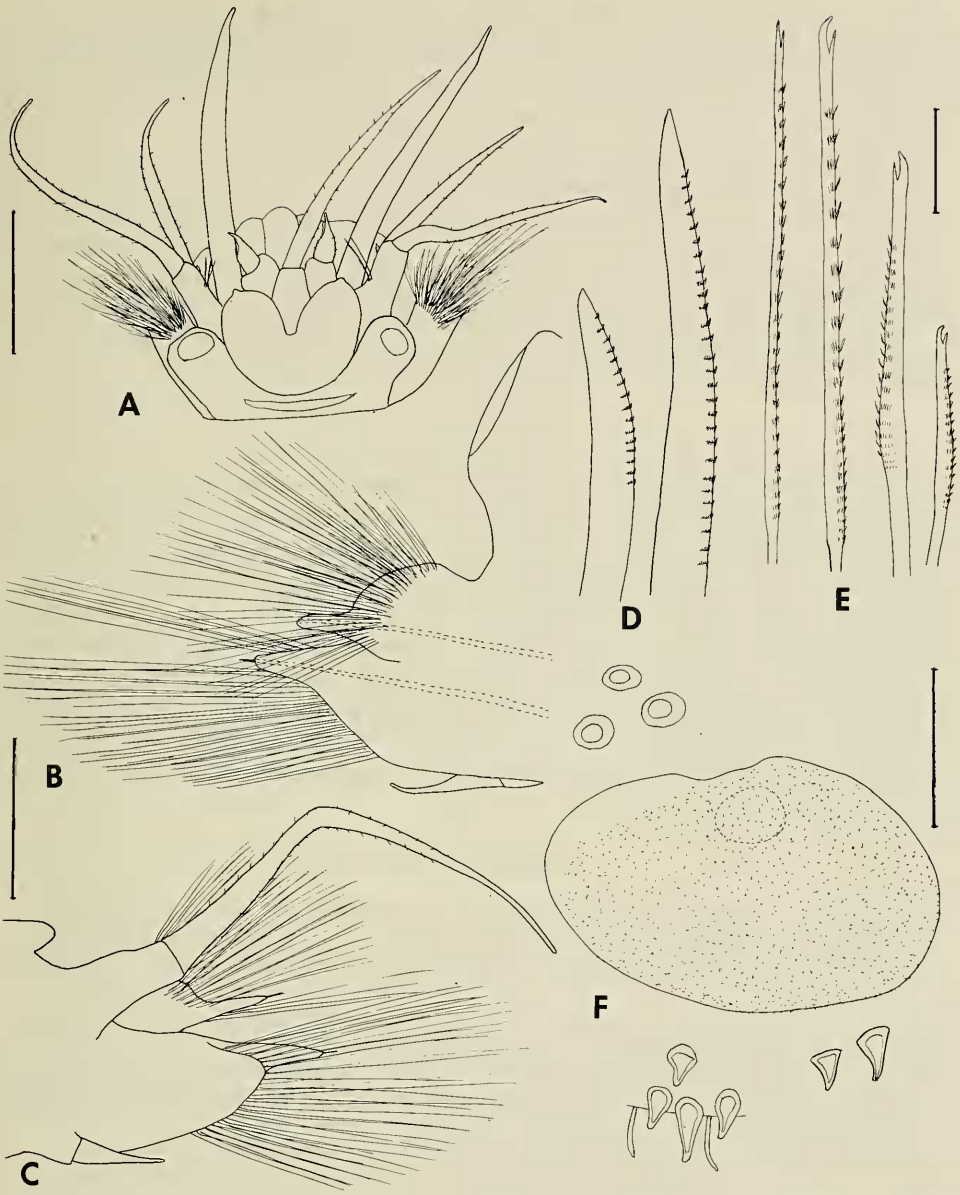

Fig. 6. *Harmothoe vagabunda,* holotype, USNM 81223: A, Dorsal view anterior end, pharynx partially extended; B, Right elytrigerous parapodium, anterior view, acicula dotted; C, Right cirrigerous parapodium, posterior view; D, Short and long notosetae; E, Upper, middle and lower neurosetae; F, Right elytron, with detail of some microtubercles and papillae. Scales: = 1.0 mm for A; 0.5 mm for B, C; 0.1 mm for D, E; 1.0 mm for F.

Pharynx with 9 pairs of black papillae and 2 pairs of hooked jaws. Ventral nephridial papillae small, beginning on segment 6. Pygidium small, with pair of anal cirri.

Distribution.—North Atlantic off Bahamas in 2066 meters depth and off St.

Croix, Virgin Islands, in 3995 meters depth. In burrows of marine wood-boring bivalves (Xylophagainae), along with more numerous polynoids *Bathykermadeca turnerae.* The ampharetid polychaete *Endecamera palea* was described by Zottoli (1982) from the same "wild" wood at the St. Croix station.

Etymology.—*vagabunda,* from Latin *vagabundus,* wandering, referring to its association with sunken pieces of wood.

Comparisons.—Both the deep-sea *H. vagabunda* and *H. ingolfiana* lack eyes and the neuropodia lack distinct digitiform supra-acicular processes, contrary to the usual condition in species of *Harmothoe. Harmothoe ingolfiana* has distinct cephalic peaks; they are very small or lacking in *H. vagabunda.* The elytra of the former have microtubercles that are spinous-tipped, with some macrotubercles present; the microtubercles are only conical in *H. vagabunda.*

Acknowledgments

I appreciate the opportunity to work up the cave polynoids received from Dr. Thomas M. Iliffe, as a part of his study on cave faunas, and the detailed information he provided on the cave habitat. I also appreciate being a part of the interesting wood and panel experiments being carried on by Dr. Ruth D. Turner in the deep North Atlantic. The collection of specimens from caves in the Turks and Caicos islands was supported in part by a National Science Foundation Grant (BSR 8215672) to Thomas M. Iliffe. The study conducted on *Alvin* "wood islands" by Ruth Turner was supported by an Office of Naval Research grant to Harvard University. My thanks go to Dr. J. B. Kirkegaard of the Zoologisk Museum, Copenhagen, for the loan of types. The manuscript benefited from the reviews of Thomas E. Bowman and Meredith L. Jones.

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